

1 MAYER BROWN LLP
2 John Nadolenco (SBN 181128)
3 350 South Grand Avenue
4 25th Floor
5 Los Angeles, CA 90071-1503
6 Telephone: (213) 229-9500
7 jnadolenco@mayerbrown.com

8 Lauren R. Goldman (*pro hac vice*)
9 1221 Avenue of the Americas
10 New York, NY 10020
11 Telephone: (212) 506-2500
12 lrgoldman@mayerbrown.com

13 *Counsel for Defendant Facebook, Inc.*

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE FACEBOOK BIOMETRIC
INFORMATION PRIVACY LITIGATION

THIS DOCUMENT RELATES TO:

ALL ACTIONS

FREDERICK WILLIAM GULLEN, on behalf
of himself and all others similarly situated,

Plaintiff,

v.

FACEBOOK, INC.,

Defendant.

**FACEBOOK, INC.'S MOTION TO
EXCLUDE PORTIONS OF THE EXPERT
REPORT, OPINIONS, AND TESTIMONY
OF DR. ATIF HASHMI**

Master Docket No.: 3:15-CV-03747-JD

Date: May 17, 2018

Time: 10:00 a.m.

Location: Courtroom 11

Hon. James Donato

*[Proposed Order and Declaration of
John Nadolenco filed concurrently herewith]*

Case No. 3:16-cv-00937-JD

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Other Authorities

Fed. R. Evid. 7021, 6, 7

Fed. R. Evid. 702 advisory committee’s note to 1972 amendment7

Labeled Faces in the Wild Home, at <http://vis-www.cs.umass.edu/lfw/>10

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NOTICE OF MOTION & MOTION

TO ALL PARTIES AND THEIR COUNSEL OF RECORD:

PLEASE TAKE NOTICE THAT, on May 17, 2018, at 10:00 a.m., or as soon thereafter as the matter can be heard, in Courtroom 11 of this Court, located at 450 Golden Gate Avenue, San Francisco, California, 94102, before the Honorable James Donato, defendant Facebook, Inc. (“Facebook”) will and hereby does move the Court for an order granting this Motion to Exclude Portions of the Expert Report, Opinions, and Testimony of Dr. Atif Hashmi. This motion is made pursuant to Federal Rule of Civil Procedure 26 and Federal Rule of Evidence 702. Good cause exists to grant this motion:

1. Dr. Hashmi’s opinions that (a) Facebook’s facial-recognition algorithms can generate face signatures for “virtually every face that is present in a photo uploaded to Facebook’s system,” which can then be used to identify those faces, including faces of non-users; and (b) Facebook’s facial-recognition algorithms “extract, learn, and rely upon facial landmarks or features” to generate face signatures, are not the product of reliable methods.

2. Dr. Hashmi is not qualified to offer the above opinions.

This motion is based on this Notice of Motion and Motion; the attached Memorandum of Points and Authorities; the accompanying Declaration of John Nadolenco; the pleadings and documents on file in this lawsuit; and any other arguments that may be raised at the hearing in this matter.

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INTRODUCTION

Plaintiffs claim that Facebook violated the Illinois Biometric Information Privacy Act (“BIPA”) by using facial-recognition technology to obtain their “scan[s] of face geometry” without providing adequate notice or obtaining their consent. To support their claims, plaintiffs have disclosed Dr. Atif Hashmi as a purported expert in source code. He plans to testify that:

[REDACTED]

[REDACTED]

[REDACTED]

The flaws in these opinions were laid bare at Dr. Hashmi’s deposition. He *admitted*:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

In other words, Dr. Hashmi admits that the code *contradicts* his first opinion and contains nothing that supports his second opinion; and he admits that he lacks the qualifications to opine about how facial-recognition technology works from a theoretical and scientific perspective. For two reasons, these concessions confirm that these opinions are inadmissible under Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

¹ Dr. Hashmi also offered two additional opinions, which are not challenged in this motion.

1 First, Dr. Hashmi's admissions demonstrate that these opinions are not "reliable" under
2 *Daubert*. Dr. Hashmi was tasked with reviewing Facebook's source code to explain how the
3 code implements Facebook's facial-recognition technology, but he admits that there is *nothing in*
4 *the source code* that supports either opinion. He attempts instead to find support for his opinions
5 in scientific principles of how facial-recognition algorithms work as a general matter, but he
6 identifies no scientific research that supports them.

7 Second, even if there were a reliable basis in the scientific research for his opinions
8 (which there is not), Dr. Hashmi would be unqualified to testify about it: as he admits, and as his
9 background confirms, he is not an expert in facial-recognition systems.

10 BACKGROUND

11 A. Facebook's Facial-Recognition Technology²

12 Facebook's Tag Suggestions feature simplifies the tagging of photos. When a person
13 uploads a photo, Facebook will sometimes, but not always, employ facial-recognition technology
14 to determine whether certain of the uploader's Facebook friends appear in the photo; if so,
15 Facebook may prompt the uploader to tag those friends. To determine whether one of those
16 friends appears in the photo, Facebook conducts four processes: detection, alignment,
17 representation, and classification. Yadan Dep. (Ex. 3) at 84; Taigman Dep. (Ex. 4) at 128-29.

18 1. Face detection:

22 2. Alignment:

24 3. Representation:

27 ² Facebook's technology is described in more detail in its contemporaneously filed motion
28 for summary judgment.

1 [REDACTED]
2 [REDACTED] A neural network is a collection of computational units (“nodes”) that
3 are combined to produce the ability to represent and recognize complex patterns, such as images
4 (of faces, animals, cars, etc.), voices, or music. *See, e.g., J. Schmidhuber, Deep Learning in*
5 *Neural Networks: An Overview* 4 (2014) (Ex. 5). A DNN is a network with many layers of
6 typically millions of nodes that have millions of weights and connections. *Id.*

7 A DNN is not explicitly programmed with instructions on how to represent and recognize
8 patterns. Instead, the network is designed to learn for itself what “features” of the input data are
9 useful for accomplishing this task. *See* Christopher M. Bishop, PATTERN RECOGNITION AND
10 MACHINE LEARNING 1-3, 226 (2006) (Ex. 6). [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]

14 A DNN learns which features of input data are most important to solving a given problem
15 by attempting to solve the problem on one example from a set of training data; being told
16 whether it reached the correct solution; using that information to adjust the millions of weights
17 associated with its millions of nodes (the network’s parameters); and then repeating the process
18 upwards of several million times. Bishop, *supra*, at 2-3, 232-42. Because of the complexity of
19 this process, the scientific community has not yet been able to explain exactly why and how
20 DNNs reach their decisions. *See, e.g.,* David Gunning, Explainable Artificial Intelligence (XAI),
21 Defense Advanced Research Projects Agency (Ex. 7); Aaron M. Bornstein, *Is Artificial*
22 *Intelligence Permanently Inscrutable?*, Nautilus, Sept. 1, 2016 (Ex. 8).

23 In the context of facial recognition, the input data to a DNN are the individual pixel
24 values³ of a face image. [REDACTED]
25 [REDACTED]

26 _____
27 ³ Each location in a digital image is a pixel. In a color photo, each pixel is expressed in
28 terms of three numerical values: the R value (red value), the G value (the green value), and the B
value (the blue value).

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[REDACTED]

4. Classification: [REDACTED]

B. Plaintiffs’ Expert Disclosure

[REDACTED]

⁴ [REDACTED]

[REDACTED]

In this case, Dr. Hashmi spent several weeks reviewing Facebook's source code. He then submitted a report containing several opinions, the first two of which are relevant to this motion:

[REDACTED]

These opinions purport to be based on Dr. Hashmi's review of the source code. [REDACTED]

⁵ [REDACTED] To avoid confusion with the "classification" step of Facebook's system, Facebook refers to the collection of algorithms as "facial recognition algorithms."

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED] Once again,
12 however, that opinion finds no support in the code: [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]

18 ARGUMENT

19 Federal Rule of Evidence 702 provides that expert testimony is admissible only where (1)
20 the expert is qualified; (2) “the testimony is based on sufficient facts or data”; (3) “the testimony
21 is the product of reliable principles and methods”; and (4) “the expert has reliably applied the
22 principles and methods to the facts of the case.” Dr. Hashmi’s opinions described above fail to
23 satisfy these requirements.

24 Dr. Hashmi was retained to review the code and, based on his purported expertise in
25 reviewing code, provide opinions about what that code does. [REDACTED]
26 [REDACTED] revealed nothing to support the opinions he wanted to give.
27 Undeterred, Dr. Hashmi gave the opinions anyway, with no support in any scientifically valid
28 sources or methodologies. This is precisely the type of unreliable testimony that is inadmissible

1 under Rule 702. Moreover, Dr. Hashmi is not qualified to provide opinions about Facebook's
2 facial-recognition technology that go beyond what the source code does, because he is not an
3 expert in facial-recognition algorithms. Each of these reasons provides an independent basis for
4 excluding Dr. Hashmi's first two opinions.

5 **I. DR. HASHMI'S FIRST TWO OPINIONS ARE UNSUPPORTED BY ANY**
6 **RELIABLE ANALYSIS OR METHODOLOGY.**

7 To be admitted under Rule 702, expert testimony must be "reliable"—*i.e.*, it must be
8 "based on sufficient facts or data" and "the product of reliable principles and methods." Fed. R.
9 Evid. 702; *see also Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993). The touchstone
10 of reliability is scientific validity. *Daubert*, 509 U.S. at 590 n.9. The disclosing party can
11 establish scientific validity by showing that the expert's conclusions are supported by principles
12 and methods that display the "hallmarks of scientific rigor: peer-reviewed research, studies, or
13 experiments." *United States v. Geanakos*, 2017 WL 4883294, at *3 (E.D. Cal. Oct. 30, 2017);
14 *see also Domingo ex rel. Domingo v. T.K.*, 289 F.3d 600, 605-06 (9th Cir. 2002). At a minimum,
15 an expert must *explain* how he reached his conclusions. *Claar v. Burlington N. R.R. Co.*, 29 F.3d
16 499, 502 (9th Cir. 1994). And where the sources upon which the expert purports to rely do not in
17 fact support the expert's conclusions, the expert's conclusions cannot be said to be a product of
18 reliable principles and methods. *See, e.g., Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 144-47 (1997);
19 *Lopez v. Wyeth-Ayerst Labs., Inc.*, 139 F.3d 905, at *1-2 (9th Cir. 1998) (unpublished mem. op.).

20 Under these authorities, there are two methods that would have sufficed to render Dr.
21 Hashmi's opinions admissible: (1) a review of the source code; or (2) a review and application
22 of peer-reviewed research on facial-recognition algorithms. Dr. Hashmi's opinions are the
23 product of neither. Dr. Hashmi admits that there is no basis in the source code for his opinions.
24 And although he claims that his opinions are supported by scientifically valid facial-recognition
25 research, the few publications he cites do not in fact support his opinions. His opinions thus
26 amount to nothing more than *ipse dixit*, which is "the antithesis of . . . scientifically reliable
27 expert opinion" and must be excluded under Rule 702. Fed. R. Evid. 702 advisory committee's
28 note to 1972 amendment.

1 **A. Dr. Hashmi Admits That The Challenged Opinions Are Not Based On A**
2 **Review Of Facebook’s Source Code.**

3 After having spent weeks reviewing Facebook’s source code, Dr. Hashmi admits that
4 *nothing* in the code supports either of the opinions at issue in this motion.

5 **1. Dr. Hashmi’s First Opinion Is Not Based On The Source Code.**

6 Dr. Hashmi’s first opinion contains two parts: [REDACTED]

7 [REDACTED]
8 [REDACTED]
9 [REDACTED] Dr. Hashmi admits that neither part is supported by the source
10 code.

11 *“Virtually every face.”* [REDACTED]

12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 *Identification of non-users.* [REDACTED]

17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 **2. Dr. Hashmi’s Opinion That Facebook’s Algorithms Extract “Facial**
23 **Landmarks Or Features” Is Not Based On The Source Code.**

24 Nor does the source code provide any support for Dr. Hashmi’s second opinion: [REDACTED]

[REDACTED]

B. Dr. Hashmi's Opinions Are Not The Product Of Peer-Reviewed Research.

Because Dr. Hashmi's opinions were not the product of his review of Facebook's source code, they are admissible only if they are supported by research that has "been subjected to normal scientific scrutiny." *Domingo*, 289 F.3d at 605-06; *see also Daubert v. Merrell Dow Pharms, Inc.*, 43 F.3d 1311, 1317-18 (9th Cir. 1995) (Rule 702 requires "objective, verifiable evidence that the testimony is based on 'scientifically valid principles'"); *Lopez*, 139 F.3d 905, at *1 (expert testimony must reflect "scientific knowledge"). They are not.

1. Dr. Hashmi's First Opinion Is Not Based On Any Research.

There is no scientific research supporting Dr. Hashmi's opinion that [REDACTED]

[REDACTED]

"Virtually every face." Dr. Hashmi's report offers no explanation or citation for his opinion that Facebook's algorithms generate face signatures for "virtually every face" in a photo.

[REDACTED]

Indeed, the only relevant statement in Dr. Hashmi's report *contradicts* his opinion. [REDACTED]

[REDACTED]

At his deposition, Dr. Hashmi manufactured a previously undisclosed basis for his conclusion: [REDACTED]

[REDACTED]

1 [REDACTED]
2 [REDACTED] But the faces in that database
3 were *already detected*. See Labeled Faces in the Wild Home, at [http://vis-](http://vis-www.cs.umass.edu/lfw/)
4 [www.cs.umass.edu/lfw/](http://vis-www.cs.umass.edu/lfw/) (“[T]he[] faces [in the database] were detected”) Accordingly, the
5 *DeepFace* paper provides no support for Dr. Hashmi’s assumption that [REDACTED]
6 [REDACTED]. Dr.
7 Hashmi’s reliance on this source is accordingly insufficient to render his opinion admissible.

8 ***Identification of non-users.*** A search of Dr. Hashmi’s report reveals *no* explanation of
9 how he concluded that face signatures can be used to identify non-users of Facebook. Absent
10 any such explanation, there is simply no basis for determining that his method was reliable as
11 required by Rule 702. See *Claar*, 29 F.3d at 502; *Watts v. Allstate Indem. Co.*, 2013 WL 210059,
12 at *11-13 (E.D. Cal. Jan. 17, 2013).

13 **2. Dr. Hashmi’s Opinion That Facebook’s Algorithms Extract “Facial**
14 **Landmarks Or Features” Is Not Based On Peer-Reviewed Research.**

15 Dr. Hashmi’s second opinion—[REDACTED]
16 [REDACTED]
17 [REDACTED]—fares no better. [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]

22 ***Facebook’s DNN.*** [REDACTED]
23 [REDACTED]
24 [REDACTED]
25 [REDACTED]
26 [REDACTED]

27 That belief is demonstrably lacking in scientific validity. [REDACTED]
28 [REDACTED]

1 [REDACTED] Nor can he. It is widely
2 recognized that DNNs are generally black boxes: Scientists have not been able to provide
3 generalizable explanations about how and why they work. *See p.3 supra.* [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]

9 The sole piece of scientific research cited by Dr. Hashmi in support of this opinion is a
10 2009 paper authored by researchers at Stanford University that describes and depicts a specific
11 type of deep network designed by the authors. [REDACTED]
12 [REDACTED]
13 [REDACTED]

14 [REDACTED] For three reasons, the Stanford paper does not support Dr. Hashmi's
15 conclusion. First, the figure in the paper *does not show* that the network extracts human-notable
16 facial features; instead, it shows that two of the network's layers extract and represent general
17 "features" (as opposed to human-notable facial features, *see p.3 supra*) from *all parts* of faces.
18 [REDACTED]

19 [REDACTED] Second, the Stanford paper
20 only purports to visualize the features learned by the network designed by the paper's authors,
21 not of any other network. [REDACTED]
22 [REDACTED]
23 [REDACTED]
24 [REDACTED]
25 [REDACTED]
26 [REDACTED]
27 [REDACTED]
28

1 Thus, there is no scientific research supporting the theory on which Dr. Hashmi's opinion
2 is based. Rule 702 requires the exclusion of that opinion.

3 **Facebook's pre-2014 algorithm.** [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]

This opinion should be excluded as well.

7 **II. DR. HASHMI IS NOT QUALIFIED TO GIVE THE CHALLENGED OPINIONS.**

8 Dr. Hashmi's inability to find support for his opinions in the source code gives rise to
9 another basis for excluding them. Under Rule 702, a witness may provide opinion testimony
10 only if he has "'knowledge, skill, experience, training or education' *relevant to such evidence or*
11 *fact in issue.*" *United States v. Chang*, 207 F.3d 1169, 1172 (9th Cir. 2000) (emphasis added).
12 "It is not enough that the proposed expert have expertise in an area of knowledge. The expertise
13 must be relevant to the determination of the facts in issue." *In re Canvas Specialty, Inc.*, 261
14 B.R. 12, 19 (Bankr. C.D. Cal. 2001); *see, e.g., Chang*, 207 F.3d at 1172-73 & n.2 (witness who
15 was "extremely qualified" in international finance was not qualified to opine on the authenticity
16 of a securities certificate where he lacked training in identification of counterfeit securities).

17 Because Dr. Hashmi does not rely on Facebook's source code to reach his opinions, any
18 expertise he may have in analyzing source code is simply irrelevant. And even if Dr. Hashmi's
19 opinions had a scientifically valid basis in research on how facial-recognition algorithms work as
20 a general matter (*but see* pp. 9-11 *supra*), Dr. Hashmi is not qualified to testify on those subjects.

21 **A. Dr. Hashmi Is Not Qualified To Opine About How Facial-Recognition**
22 **Algorithms Generally Work.**

23 [REDACTED]
24 [REDACTED]
25 [REDACTED]
26 [REDACTED]
27 [REDACTED] He therefore has no qualification to opine on the capabilities of
28 Facebook's facial-recognition system or on what type of information Facebook's facial-

1 recognition system—or, for than matter, *any* facial-recognition system—extracts, learns, or relies
2 on to generate face signatures.

3 Dr. Hashmi’s lack of expertise is confirmed by his ignorance and misunderstanding of
4 basic facial-recognition concepts that underpin his opinions. [REDACTED]

5 [REDACTED]
6 [REDACTED]
7 [REDACTED] At his deposition, Dr. Hashmi revealed an utter lack of knowledge
8 about face detection algorithms. The “seminal,” “most influential work” on face detection is the
9 Viola-Jones detection approach. Bin Yang et al., *Aggregate Channel Features for Multi-view*
10 *Face Detection* 1 (Ex. 10); Cha Zhang & Zhengyou Zhang, *A Survey of Recent Advances in Face*
11 *Detection, Technical Report MSR-TR-2010-66* at 1, Microsoft Research (2010) (Ex. 11). [REDACTED]

12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED] On this
18 subject, too, he is woefully uninformed. A well-known and standard type of feature that is used
19 by facial- and other object-recognition algorithms is a “texture measure.” *See, e.g.,* Mark Nixon
20 & Alberto Aguado, *FEATURE EXTRACTION & IMAGE PROCESSING* ch. 8 (2d ed. 2008) (Ex. 12)
21 (devoting chapter to texture description, segmentation and classification); B.S. Manjunath &
22 W.Y. Ma, *Texture Features for Browsing and Retrieval of Image Data*, *IEEE Transactions on*
23 *Pattern Analysis and Machine Intelligence* 18: 837 (1996) (Ex. 13) (“Texture analysis has a long
24 history . . .”). [REDACTED]

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED] He is not, and that lack of expertise in holistic
5 and any other facial-recognition algorithms, renders him unqualified to present his first two
6 opinions at trial.

7 **B. Dr. Hashmi Cannot Compensate For His Lack Of Expertise In**
8 **Facial-Recognition Algorithms With Expertise In Deep Neural Networks.**

9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED] But that limited experience falls far short of establishing his expertise in *all*
13 DNNs. And it certainly does not establish his expertise to opine on Facebook's
14 facial-recognition system—[REDACTED].

15 Dr. Hashmi is not an expert on DNNs generally. [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]

22 These limited experiences are far from the “extensive hands-on experience over a meaningful
23 period of time during which a person develops a working expertise in a certain area.” *Jones v.*
24 *Lincoln Elec. Co.*, 188 F.3d 709, 724 (7th Cir. 1999).

25 But even if Dr. Hashmi had expertise in DNNs generally, that expertise would not be
26 relevant to the two opinions challenged in this motion. [REDACTED]
27 [REDACTED]
28 [REDACTED]

1 [REDACTED]
2 Nor would such experience allow Dr. Hashmi to opine on the features extracted, learned,
3 or relied on by Facebook's facial-recognition DNN. [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]

10 It is irrelevant that he might have
11 experience with *other* technologies that use DNNs to accomplish tasks like audio and motion
12 pattern classification. *See, e.g., Avila v. Willits Env'l Remediation Tr.*, 633 F.3d 828, 839 (9th
13 Cir. 2011); *Colby v. Newman*, 2012 WL 12885118, at *5 (C.D. Cal. Nov. 20, 2012).

14 In short, Dr. Hashmi is not qualified to opine on (1) whether Facebook's facial-
15 recognition algorithms generate face signatures for "virtually every face" that appears in a photo
16 uploaded to Facebook, and whether those face signatures can be used to identify non-users; and
17 (2) whether Facebook's facial-recognition algorithms extract, learn, or rely on "facial landmarks
18 and features" to generate face signatures. These opinions should be excluded.

19 CONCLUSION

20 For the foregoing reasons, Facebook respectfully requests that this Court exclude the
21 portions of Dr. Hashmi's report, opinions, and proposed testimony on (1) the ability of
22 Facebook's algorithms to generate face signatures for and use those face signatures to identify
23 virtually every face that appears in a photo, including faces of non-users; and (2) the information
24 that is extracted, learned, and relied on by Facebook's algorithms to generate face signatures.

25 Dated: March 16, 2018

MAYER BROWN LLP

26 By: /s/ John Nadolenco

John Nadolenco

Lauren R. Goldman

27 Counsel for Defendant Facebook, Inc.
28